**IB chemistry energetics** the study of the energy exchanges between a system and its surroundings.

**Exothermic and endothermic: Reaction between magnesium and sulphuric acid**

***Main idea***

Every chemical reaction or system exchanges energy with its immediate surroundings; it either releases energy to these surroundings or absorbs energy from them.

1. Write a balanced symbol equation, including state symbols, for the reaction.
2. When the reaction was taking place what did the outside of the test tube feel like?
3. (a) Identify the reactants in this reaction.

(b) Identify the products.

4. In energetics, the reactants and the products in the reaction are called the system. Everything else in the

universe is referred to as the surroundings. Name the substances that make up the immediate

surroundings of this reacting system.

5. In question 2 in which part of the universe did you make this observation? Explain the observation.

6. (a) In the boxes below show how the energy of both the system and the surroundings changes when

magnesium reacts with sulphuric acid. Use horizontal lines to indicate the energy before (reactants) and

after (products) the reaction.

|  |  |  |
| --- | --- | --- |
| System |  | Surroundings |

(b) Considering your answer to question 5, what feature in each energy level profile you have drawn

above should be the same for both.

***Main idea***

During any chemical reaction energy moves into the system or is absorbed and energy moves out or is released.

In an exothermic reaction more energy is released than is absorbed so there is a net release of energy.

In an endothermic reaction more energy is absorbed than is released so there is a net absorption of energy.

1. What is the energy that moves into a system used for?
2. Identify the bonds that need to be broken in this reaction.
3. What is the energy that moves out of a system used for?
4. Identify the bonds that have been made in this reaction.
5. Is the reaction between magnesium and hydrochloric acid endothermic or exothermic? Explain your answer.
6. What did your answer to question 11 tell you about the bonds that were broken and made in this reaction?